

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF MAILING BY "EXPRESS MAIL"

In re Patent Application of:  
DI BERNARDO ET AL.

Serial No. Not yet assigned

Filing Date: Herewith

For: ROBUST COMMUNICATION SYSTEM  
FOR TRANSMISSIONS IN A NOISY  
ENVIRONMENT

"EXPRESS MAIL" MAILING LABEL NUMBER EL90646637US

DATE OF DEPOSIT December 28, 2000

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Eric Link  
(TYPED OR PRINTED NAME OF PERSON MAILING PAPER OR FEE)

Eric Link  
(SIGNATURE OF PERSON MAILING PAPER OR FEE)

PRELIMINARY AMENDMENT

Director, U.S. Patent and Trademark Office  
Washington, D.C. 20231

Sir:

Prior to the calculation of fees and examination of  
the present application, please enter the amendments and  
remarks set out below.

In the Drawings:

Submitted herewith is a request for proposed drawing  
modifications as indicated in red ink to label FIGS. 1, 3-5,  
and 8-9 as prior art. The blocks and plot labels in FIGS. 2,  
6-7, and 10-11 are also being translated as indicated in red  
ink. FIGS. 4-5, 8-10, and 12-15 are being further modified to  
remove extraneous markings therefrom as indicated in red ink.

In the Claims:

Please cancel Claims 1 to 8.

Please add new Claims 9 to 32.

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9. A communication system comprising:  
a transmission channel;  
a signal source for providing a discrete signal;  
a chaotic modulator for modulating the discrete  
signal for transmitting over said transmission channel; and  
an incoherent discriminator for receiving the  
modulated discrete signal from said transmission channel.

10. A communication system according to Claim 9,  
wherein said incoherent discriminator comprises:  
a high-pass filter;  
a rectifier connected to an output of said high-pass  
filter; and  
a low-pass filter connected to an output of said  
rectifier.

11. A communication system according to Claim 10,  
wherein said incoherent discriminator further comprises a  
comparator connected to an output of said low-pass filter.

12. A communication system according to Claim 9,  
wherein said incoherent discriminator is self-synchronizing.

13. A communication system according to Claim 9,  
wherein said signal source generates a low logic value signal  
having associated therewith a chaotic evolution corresponding  
to a complete Chua's attractor.

14. A communication system according to Claim 9,  
wherein said incoherent discriminator comprises:  
a low-pass filter;

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a null-threshold comparator connected to an output of said low-pass filter for providing a square-wave output signal; and

a divider connected an output of said comparator for scaling the square-wave output signal.

15. A communication system according to Claim 14, wherein said signal source generates a low logic value signal that is associated with a chaotic dynamics corresponding to a left-hand lobe of a Chua's attractor.

16. A communication system according to Claim 14, wherein said low-pass filter is a fourth order filter.

17. A communication system comprising:  
a digital signal source for providing a digital signal;  
a chaotic modulator for modulating the digital signal for transmitting over a transmission channel; and  
an incoherent discriminator for receiving the modulated digital signal from the transmission channel, said incoherent discriminator comprising  
a high-pass filter,  
a rectifier connected to an output of said high-pass filter, and  
a low-pass filter connected to an output of said rectifier.

18. A communication system according to Claim 17, wherein said incoherent discriminator further comprises a comparator connected to an output of said low-pass filter.

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**DI BERNARDO ET AL.**  
Serial No. **Not Yet Assigned**  
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19. A communication system according to Claim 17, wherein said incoherent discriminator is self-synchronizing.

20. A communication system according to Claim 17, wherein said digital signal source generates a low logic value signal having associated therewith a chaotic evolution corresponding to a complete Chua's attractor.

21. A communication system comprising:  
a digital signal source for providing a digital signal;  
a chaotic modulator for modulating the digital signal for transmitting over a transmission channel; and  
an incoherent discriminator for receiving the modulated digital signal, said incoherent discriminator comprising  
a low-pass filter,  
a null-threshold comparator connected to an output of said low-pass filter for providing a square-wave output signal, and  
a divider connected an output of said comparator for scaling the square-wave output signal.

22. A communication system according to Claim 21, wherein said digital signal source generates a low logic value signal having associated therewith a chaotic evolution corresponding to a complete Chua's attractor.

23. A communication system according to Claim 21, wherein said digital signal source generates a low logic value

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that is associated with a chaotic dynamics corresponding to a left-hand lobe of a Chua's attractor.

24. A communication system according to Claim 21, wherein said low-pass filter is a fourth order filter.

25. A method for transmitting a signal over a transmission channel, the method comprising:  
generating a discrete signal;  
modulating the discrete signal using a chaotic modulator for transmitting over the transmission channel; and  
receiving the modulated discrete signal from the transmission channel using an incoherent discriminator.

26. A method according to Claim 25, wherein receiving the modulated discrete signal comprises:  
filtering the modulated discrete signal using a high-pass filter;  
rectifying the filtered signal from the high-pass filter; and  
filtering the rectified signal from the high-pass filter using a low-pass filter.

27. A method according to Claim 26, further comprising using a comparator for a generating square wave signal from the filtered signal provided by the low-pass filter.

28. A method according to Claim 25, wherein the incoherent discriminator is self-synchronizing.

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29. A method according to Claim 25, wherein a signal source generates a low logic value signal that is associated with a chaotic dynamics corresponding to a left-hand lobe of a Chua's attractor.

30. A method according to Claim 25, further comprising:

filtering the modulated signal using a low-pass filter;

providing a square-wave output signal using a null-threshold comparator connected to an output of the low-pass filter; and

scaling the square-wave output signal using a divider connected an output of the comparator.

31. A method according to Claim 30, wherein the signal source generates a low logic value that is associated with a chaotic dynamics corresponding to a left-hand lobe of a Chua's attractor.

32. A method according to Claim 25, wherein the low-pass filter is a fourth order filter.

#### REMARKS

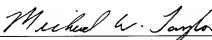
It is believed that all of the claims are patentable over the prior art. For better readability and the Examiner's convenience, the newly submitted claims differ from the translated counterpart claims which are being canceled. The newly submitted claims do not represent changes or amendments that narrow the claim scope for any reason related to the statutory requirements for patentability. Accordingly, after

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the Examiner completes a thorough examination and finds the claims patentable, a Notice of Allowance is respectfully requested in due course. Should the Examiner determine any minor informalities that need to be addressed, he is encouraged to contact the undersigned attorney at the telephone number below.

Respectfully submitted,

  
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ENVIRONMENT )  
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SUBMISSION OF PROPOSED MODIFICATIONS TO DRAWINGS

Director, U.S. Patent and Trademark Office  
Washington, D.C. 20231

Sir:

Submitted herewith is a request for proposed drawing modifications as indicated in red ink to label FIGS. 1, 3-5, and 8-9 as prior art. The blocks and plot labels in FIGS. 2, 6-7, and 10-11 are also being translated as indicated in red ink. FIGS. 4-5, 8-10, and 12-15 are being further modified to remove extraneous markings therefrom as indicated in red ink.

**CERTIFICATE OF MAILING BY "EXPRESS MAIL"**

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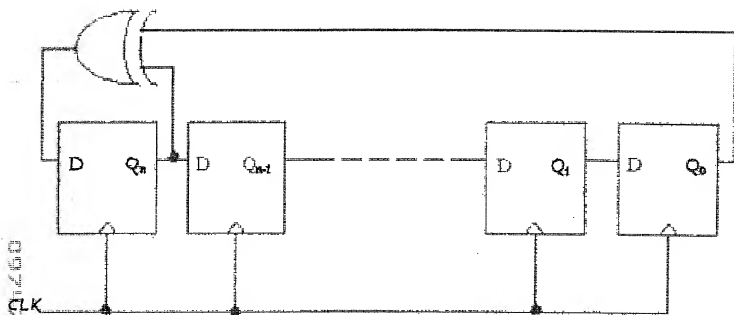
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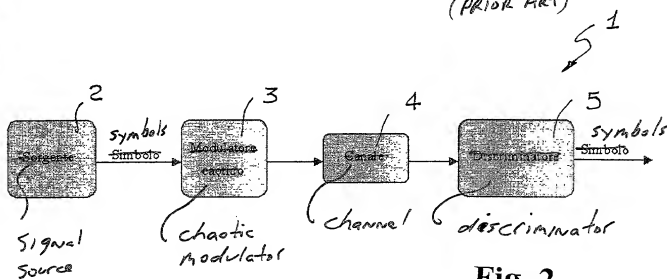
Respectfully submitted,

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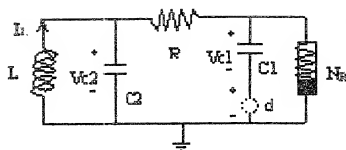




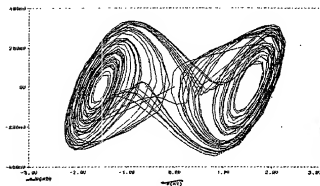
**Fig. 1**  
(PRIOR ART)



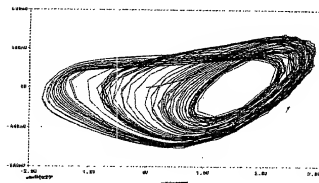
**Fig. 2**



**Fig. 3**  
(PRIOR ART)



**Fig. 4**  
(PRIOR ART)



**Fig. 5**  
(PRIOR ART)

input signal  
 Segnale in ingresso  
 transmit signal  
 Segnale trasmesso  
 filtered signal  
 Segnale filtrato  
 reconstructed signal  
 Segnale in uscita

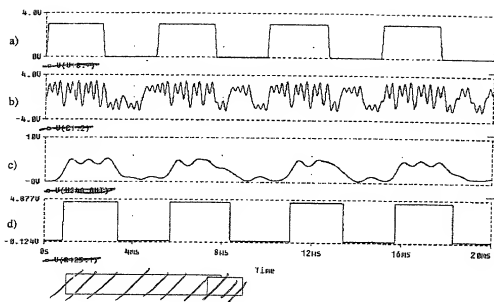


Fig. 6

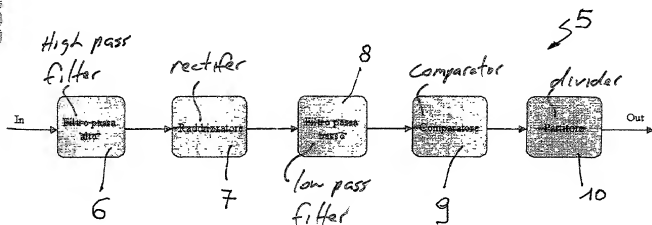
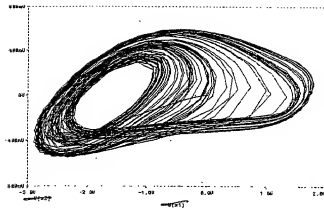
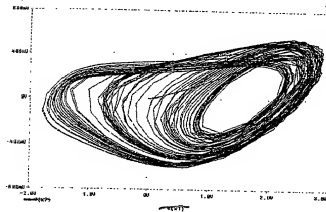


Fig. 7



**Fig. 8**  
(PRIOR ART)



**Fig. 9**  
(PRIOR ART)

09747786.122000

input signal

Segnale in ingresso

transmit signal

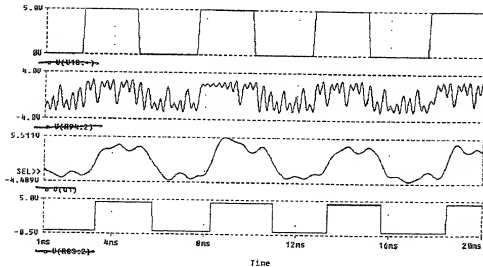
Segnale trasmesso

filtered signal

Segnale filtrato

reconstructed signal

Segnale in uscita



**Fig. 10**

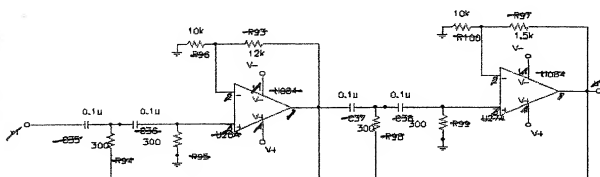
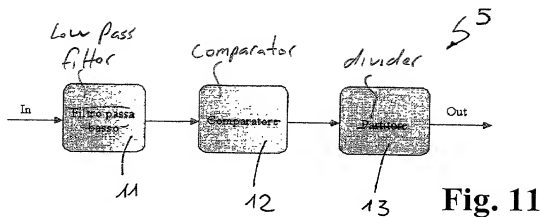


Fig. 12

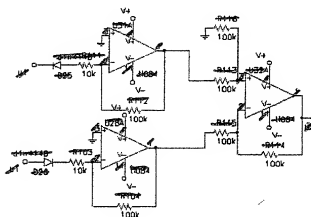


Fig. 13

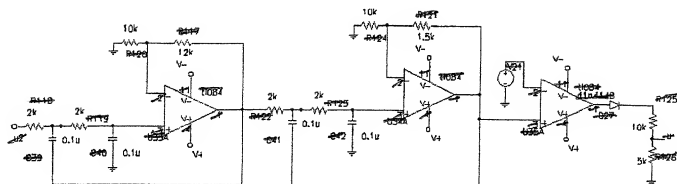


Fig. 14

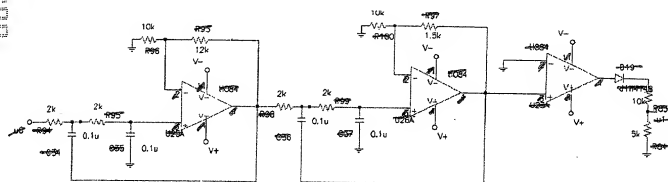


Fig. 15